

Application No.: 09/997,344
 Old Attorney's Docket No. 040071-246
 New Attorney's Docket No. 0119-156
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REMARKS

Claims 1-21 are now pending in the application. Original claims 1, 3-5, 7-9, and 14-16 have been amended, and new claims 18-21 added, without introduction of new matter. Favorable reconsideration is respectfully requested in view of the above amendments and the following remarks.

The Office objected to the Information Disclosure Statement (IDS) filed on March 21, 2003 on the basis that the IDS did not include a PTO 1449, and further based on the allegation that an International Search Report was listed in the IDS, but no copy of the search report was received by the Office. Applicant respectfully traverses this objection.

As to the lack of a PTO 1449, the Office is reminded that IDSs are not required to include a PTO 1449 form, and that information that is otherwise properly submitted to the Office must be considered. See, e.g., M.P.E.P. § 609IIC(2) (Rev. 2, May 2004, page 600-138), which instructs: "If the citations are submitted on a list other than on a form PTO-1449 or PTO/SB/08A and 08B, the examiner may write 'all considered' and his or her initials to indicate that all citations have been considered." In the present instance, the "list" included only the one reference (i.e., the International Search Report), and the Examiner may indicate his consideration of the document by writing his initials on the IDS itself. (As to the references cited in the International Search Report, the March 21, 2003 IDS explained that they had previously been submitted to the Office in an IDS filed on July 23, 2002, and so were not being re-submitted.)

As to the allegation that the IDS was not submitted along with a copy of the cited search report, this is simply not accurate. Attached to this paper is a copy of the "Image File Wrapper for Application No.:09/997,344" that Applicants' representative obtained from Private PAIR. As can be seen, there are two entries for March 21, 2003: A 2-page entry for the IDS itself, and a 3-page entry for Non-Patent Literature (NPL). This latter entry is the "missing" International Search Report, a copy of which was downloaded from Private PAIR and is attached herewith. Note that the first page of this International Search Report includes the Office's own stamp, which reads:

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In view of the foregoing, it is respectfully asserted that the Information Disclosure Statement filed on March 21, 2003 was properly submitted to the Office, and that the cited document (i.e., the International Search Report) was included therewith. Accordingly, it is respectfully requested that the International Search Report be considered by the Office, and that the Office provide Applicants with some evidence of such consideration (e.g., returning an Examiner-initialed copy of the IDS itself).

The specification was objected to because the US Patent Application number for a document identified on page 10 is missing. In response, the specification has been amended to include the corresponding serial number. Therefore, it is respectfully requested that the objection to the specification be withdrawn.

Claims 4-17 were objected to for various informalities. In response, claims 4, 8, 7, and 14 have been amended paying particular attention to address the concerns expressed in the Action. Accordingly, withdrawal of the objection to the claims is respectfully requested.

Claims 4-17 stand rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the enablement requirement. In particular, the Office alleges that the application is non-enabling with respect to the claimed "determining the set of complex channel estimates based on the phase offset and the first set of channel estimates." This rejection is respectfully traversed.

"The test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation." *United States v. Teletronics, Inc.*, 857 F.2d 778, 785, 8 USPQ2d 1217, 1223 (Fed. Cir. 1988). It is also well settled that "A patent need not teach, and preferably omits, what is well known in the art." *In re Buchner*, 929 F.2d 660, 661, 18 USPQ2d 1331, 1332 (Fed. Cir. 1991); *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1384, 231 USPQ 81, 94 (Fed. Cir. 1986), cert. denied, 480 U.S. 947 (1987); and *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1463, 221 USPQ 481, 489 (Fed. Cir. 1984).

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In the present instance, Applicants' specification easily satisfies this standard. As taught in Applicants' specification, the conventional solution to the problem of determining complex values that represent an estimate of the channel is to use the pilot signals transmitted on a channel. See Specification page 7, line 29 through page 8, line 4. In communication systems such as Wideband Code Division Multiple Access (WCDMA), it is desired to determine a complex channel estimate of the Dedicated Physical Channel (DPCH). However, this channel usually experiences more noise than the Common Pilot Channel (CPICH), and therefore has a higher Signal-to-Interference-Ratio (SIR) than the CPICH.

The application, therefore, explains that it would be advantageous to use information measured on the CPICH to derive an estimate of the DPCH. One can consider doing this because the CPICH and DPCH are both transmitted from the same base station antenna(s) (see, e.g., FIG. 3), and are therefore subject to the same environment that can, for example, cause multipath effects. Consequently, channel estimates based on the CPICH and DPCH are both useful for providing a good estimate of the channel coefficients. (See, e.g., the specification at page 15, lines 9-12; and at page 19, lines 28-29.)

But, as explained in the application at, for example, page 11, line 4 through page 13, line 3, the CPICH can have any of four possible phase offsets relative to the DPCH, and the particular phase offset at any given instant is generally unknown to the receiver. (See, e.g., specification at page 12, lines 20-21.) It is desired to use a channel estimate based on the CPICH because this estimate can be more accurate than one based on the DPCH, and more accurate channel estimates in turn improve the accuracy of the maximum ratio rake combining to be performed and the accuracy of the eventual detected symbols. (See specification at page 15, lines 1-6.) Thus, the problem presented is how to determine the phase offset between the CPICH and the DPCH so that the estimate of the CPICH can be adjusted and used for maximum ratio combining of the DPCH. (See, e.g., specification at page 15, lines 14-16; and lines 21-22.)

The specification describes the solution. At page 15, lines 23-30, the second antenna channels for CPICH and DPCH, represented by the subscripts 2c and 2d, are presented as:

$$h_{2c}^i = a_i e^{j\alpha i} \quad (3)$$

$$h_{2d}^i = b_i e^{j\beta i} \quad (4)$$

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respectively, where $i \in [1, n]$ is the rake finger number, a and b are the respective channel gains, and α and β are the respective antenna phases.

The specification then goes on to derive the true phase difference between the CPICH and the DPCH (see Equation (14) at page 18, line 1). If it is assumed that the CPICH and DPCH are independent (a valid assumption in many communication systems including 3GPP), equation (14) can be rewritten as the simpler (see page 19, line 1):

$$\varphi \in \{\pi/4, 3\pi/4, 5\pi/4, 7\pi/4\} \sum_{i=1}^n \frac{(\hat{\alpha}_i - \hat{\beta}_i + \varphi)^2}{\sigma_{ei}^2} \quad (16)$$

where:

$i \in [1, n]$ is a rake finger number of the receiver, and

$\hat{\alpha}_i$ and $\hat{\beta}_i$ are the respective first and second antenna phase estimates derived for rake finger i from the first and second sets of channel estimates, and

σ_{ei}^2 is related to the power of interference.

At page 19, lines 28-29, the specification explains that, since the CPICH and DPCH are transmitted through the same physical medium, they experience the same multipath and differ by the phase offset. Accordingly, as stated at page 20, lines 21-23, “[t]he channel estimates to be used for combining are calculated 650, by compensating the CPICH channel estimates with the estimated phase.” (Emphasis added.) One of ordinary skill in the art at the time the invention was made would readily understand that, in this instance, “compensating ... with the estimated phase” means rotating the CPICH channel estimates by the phase offset value just calculated. Once the CPICH channel estimates are rotated, they may be used in the maximum ratio combining process that is applied to the outputs of the rake fingers, as described at page 15, lines 1-6.

In view of the foregoing, it is respectfully asserted that the specification is enabling with respect to claims 4-17. Accordingly, it is respectfully requested that the rejection of claims 4-17 under 35 U.S.C. §112, first paragraph, be withdrawn.

Claims 1-3 stand rejected under 35 U.S.C. §102(e) as allegedly being anticipated by Salonen et al. (US 6,611,675). This rejection is respectfully traversed.

Independent claim 1 has been amended to now define “determining an estimate of the phase offset based on a set of first and second antenna phase estimates derived from the first

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and second sets of channel estimates, respectively.” (Emphasis added.) Support for this amendment may be found, for example, in Equations (14) and (16), which are found on respective pages 18 and 19 of the specification.

The technique taught by Salonen et al. does not anticipate any of Applicants' claims at least because the Salonen et al. technique does not involve basing an estimate of the phase offset on “a set of first and second antenna phase estimates derived from respective first and second sets of channel estimates,” as now recited in the claims. Rather, Salonen et al., at column 2, lines 18-45; and at column 2, line 56 through column 3, lines 23, disclose two embodiments, each of which utilizes a complete channel estimate for determining the phase offset value. Nowhere do Salonen et al. disclose deriving first and second antenna phase estimates from the channel estimates, and then using these first and second antenna phase estimates as the basis for determining an estimate of the phase offset.

For at least the foregoing reasons, independent claim 1, as well as the related claims 2-3, are believed to be patentably distinguishable over the Salonen et al. patent. Therefore, it is respectfully requested that the rejection of claims 1-3 under 35 U.S.C. §102(e) be withdrawn.

Claims 4-17 were not subject to the rejection under Section 102. However, it is noted that independent claims 4, 7, and 11 have likewise been amended to define “determining an estimate of the phase offset based on a set of first and second antenna phase estimates derived from the first and second sets of channel estimates, respectively,” (emphasis added), and are therefore believed to be, along with their related dependent claims 5-6, 8-10, and 12-17, patentably distinguishable over the prior art of record for at least the same reasons as those set forth above with respect to independent claim 1.

In addition, the dependent claims 5-6, 8-10, and 12-17 are additionally patentably distinguishable over the prior art of record because of the additional novel features that they variously define. For example, claims 5, 9, and 16 each define a particular mathematical technique for determining the phase offset value, which technique involves the antenna phase estimates derived from the first and second sets of channel estimates. Salonen et al. are silent with respect to this feature.

New claims 18-21 have been added to the application without introduction of new matter. These claims depend, respectively, from independent claims 4, 7, 14, and 1, and are


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therefore patentable for at least the reasons set forth above with respect to those base claims, as well as the additional novel and nonobvious features that they define.

The application is believed to be in condition for allowance. Prompt notice of same is respectfully requested.

Respectfully submitted,
Potomac Patent Group PLLC

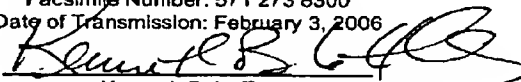
Date: February 3, 2006

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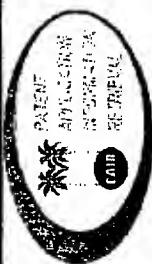
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United States Patent and Trademark Office

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PATENT APPLICATION INFORMATION RETRIEVAL

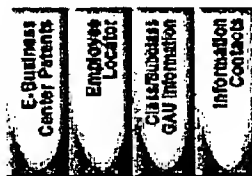
Image File Wrapper for Application No.: 09/997,344

This application is officially maintained in electronic form. To View: Click the desired Document Description. To Download and Print: Check the desired document(s) and click Download.

Mail Room Date	Document Description	Document Category	Page Count	All	None	Download
12/15/2005	Communication - Re: Power of Attorney (PTOL-308)	PROSECUTION	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12/10/2005	Power of Attorney (may include Associate POA)	PROSECUTION	4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10/03/2005	Index of Claims	PROSECUTION	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10/03/2005	Bibliographic Data Sheet	PROSECUTION	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10/03/2005	List of references cited by examiner	PROSECUTION	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10/03/2005	List of References cited by applicant and considered by examiner	PROSECUTION	3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10/03/2005	Non-Final Rejection	PROSECUTION	6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10/03/2005	Search information including classification, databases and other search related notes	PROSECUTION	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
09/27/2005	Examiner's search strategy and results	PROSECUTION	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
03/21/2003	NPL Documents	PRIOR ART	3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
03/21/2003	Information Disclosure Statement (IDS) Filed	PROSECUTION	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
08/21/2002	NPL Documents	PRIOR ART	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
08/21/2002	Information Disclosure Statement (IDS) Filed	PROSECUTION	3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
08/21/2002	Foreign Reference	PRIOR ART	18	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
08/21/2002	Foreign Reference	PRIOR ART	20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
06/19/2002	NPL Documents	PRIOR ART	27	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Other Links



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06/19/2002	Information Disclosure Statement (IDS) Filed	PROSECUTION	3	<input type="checkbox"/>
06/10/2002	Foreign Reference	PRIOR ART	5	<input type="checkbox"/>
06/10/2002	Foreign Reference	PRIOR ART	3	<input type="checkbox"/>
06/10/2002	Foreign Reference	PRIOR ART	4	<input type="checkbox"/>
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06/10/2002	Foreign Reference	PRIOR ART	15	<input type="checkbox"/>
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06/10/2002	Foreign Reference	PRIOR ART	27	<input type="checkbox"/>
06/10/2002	Foreign Reference	PRIOR ART	18	<input type="checkbox"/>
06/10/2002	Foreign Reference	PRIOR ART	12	<input type="checkbox"/>
06/10/2002	NPL Documents	PRIOR ART	6	<input type="checkbox"/>
06/10/2002	NPL Documents	PRIOR ART	42	<input type="checkbox"/>
06/10/2002	NPL Documents	PRIOR ART	44	<input type="checkbox"/>
06/10/2002	NPL Documents	PRIOR ART	26	<input type="checkbox"/>
06/10/2002	Information Disclosure Statement (IDS) Filed	PROSECUTION	3	<input type="checkbox"/>
06/10/2002	Foreign Reference	PRIOR ART	3	<input type="checkbox"/>
03/05/2002	Oath or Declaration filed	PROSECUTION	2	<input type="checkbox"/>
03/05/2002	Miscellaneous Incoming Letter	PROSECUTION	2	<input type="checkbox"/>
12/19/2001	Miscellaneous Action with SSP	PROSECUTION	1	<input type="checkbox"/>
11/28/2001	Fee Worksheet (PTO-875)	PROSECUTION	1	<input type="checkbox"/>
11/28/2001	Bibliographic Data Sheet	PROSECUTION	1	<input type="checkbox"/>
11/28/2001	Oath or Declaration filed	PROSECUTION	2	<input type="checkbox"/>
11/28/2001	Drawings	PROSECUTION	6	<input type="checkbox"/>
11/28/2001	Abstract	PROSECUTION	1	<input type="checkbox"/>
11/28/2001	Claims	PROSECUTION	5	<input type="checkbox"/>
11/28/2001	Specification	PROSECUTION	22	<input type="checkbox"/>

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11/28/2001	<u>Transmittal letter</u>	PROSECUTION	2	<input type="checkbox"/>
11/28/2001	<u>Claims Worksheet (PTO-2022)</u>	PROSECUTION	1	<input type="checkbox"/>
11/28/2001	<u>Fee Worksheet (PTO-875)</u>	PROSECUTION	1	<input type="checkbox"/>

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference P13645 W01	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/EP 02/ 12666	International filing date (day/month/year) 13/11/2002	(Earliest) Priority Date (day/month/year) 28/11/2001
Applicant TELEFONAKTIEBOLAGET LM ERICSSON (PUBL)		

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This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

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This International Search Report consists of a total of 3 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (see Box II).

4. With regard to the title,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the abstract,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.

4

None of the figures.

Form PCT/ISA/210 (first sheet) (July 1998)

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 02/12666

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04L25/02 H04B7/06 H04B1/707

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04L H04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 133 072 A (MATSUSHITA ELECTRIC IND CO LTD) 12 September 2001 (2001-09-12) abstract page 4, line 30 -page 6, line 34; figure 5 claims 1-8	1-17
A	EP 0 964 529 A (MATSUSHITA ELECTRIC IND CO LTD) 15 December 1999 (1999-12-15) column 5, line 30 -column 6, line 55 claims 1-4 column 4, line 3 - line 38	1-17

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

Z document member of the same patent family

Date of the actual completion of the international search

11 February 2003

Date of mailing of the international search report

18/02/2003

Name and mailing address of the ISA

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Authorized officer

Ó Donnabháin, E

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No.

PCT/EP 02/12666

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
EP 1133072	A	12-09-2001	JP	2001069050 A	16-03-2001
			AU	6725600 A	26-03-2001
			BR	0007040 A	17-07-2001
			EP	1133072 A1	12-09-2001
			CN	1320308 T	31-10-2001
			WO	0117130 A1	08-03-2001
EP 0964529	A	15-12-1999	JP	2000004212 A	07-01-2000
			CN	1239361 A	22-12-1999
			EP	0964529 A2	15-12-1999
			KR	2000006026 A	25-01-2000

Form PCT/ISA/210 (patent family annex) (July 1992)